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ABSTRACT

Summarized in this paper are the literature on cognitive imagery and teaching methodologies and an approach to the teaching of theories of personality that emphasize cognitive imagery as a strategy for enhancing learning in college students. The work of Kosslyn represents a major approach to the study of imagery in cognitive psychology. Central to this argument is the importance of imagery as a way of processing information and an insistence that the imagery does not imply literal, internal pictures in the head. Kosslyn, as well as Day, Toth, Hampden-Turner, and others, focus on the potential importance of cognitive variables for enhancing learning of complex materials. The implications of this as a tool of learning for college students can be seen in the teaching of theories of personality. Students in two advanced classes in personality theory were required to make diagrams or drawings of each major personality theory, indicating visually the way various concepts were interrelated. Students reported significantly enhanced understanding of the theories and their interrelationships. (LP)

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Cognitive Imagery and Diagrams in Teaching Personality Theory

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Abstract

The role of imagery in cognitive processing and its implications for enhancing educational strategies is receiving increasing attention in psychology. The present paper briefly summarizes the literature on cognitive imagery and teaching methodology and presents an approach to the teaching of personality theory that utilizes cognitive imagery as a major tool of learning for college students.

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Cognitive Imagery and Diagrams in Teaching Personality Theory

The role of imagery in cognition as a mode of information processing complementary to verbal or propositional modes has been receiving increasing attention in psychology (Block, 1981; Kosslyn, 1980, 1983; Paivio, 1970, 1971). While the precise role of cognitive imagery in learning and memory has been characterized by considerable debate, research has been accumulating that supports the relevance and importance of extending our understanding of cognitive functioning to include a role for non-propositional and imagery modes. The implications of this research for teaching methodology are also receiving increasing attention. This paper briefly summarizes the literature on cognitive imagery and teaching methodologies and presents an approach to the teaching of Theories of Personality that emphasizes cognitive imagery as a strategy for enhancing learning in college students.

Cognitive Imagery

The return of an interest in imagery as a topic for experimental attention (Block, 1981; Kosslyn, 1980) has been accompanied quite understandably by an abundance of speculation and theory attempting to find ways of articulating the place of mental imagery with respect to other forms of processing information. Paivio's (1970, 1971) model of imagery, one of the major alternatives to S-R behavioral traditions, proposed two major coding systems: an abstract, propositional, and verbal system which processed sequentially and an analogical, visual system which could handle simultaneous and parallel processing. This model has been criticized in a number of ways, particularly through stressing that visual and verbal systems are not literal stored constituents in

cognitive processing, but represent "tools" of symbolic thinking for temporary processing of different types of information in different ways (Yuille & Catchpole, 1977).

One of the major approaches to the study of imagery in current cognitive psychology is represented by the work of Kosslyn (1980; 1983). Again, central to his argument and that of a variety of other researchers in the field today (Block, 1981) is the importance of imagery as a way of processing information and an insistence that imagery does not imply literal, internal pictures in the head. Kosslyn (1980) insists repeatedly that imagery is only one of perhaps many modes of thought, though it is a phenomenon in its own right, not merely a spin off from other more primary representational modes. In addition, imagery constitutes a concept capable of being studied experimentally. The creation of a computer model for the representation, storing, and accessing of visually coded information is perhaps Kosslyn's (1980) central contribution, and he and his colleagues have devoted extensive experimental attention to hypotheses related to this model.

The research direction taken by Kosslyn (1980) and colleagues has involved posing experimental questions and problems to participants which might be processed in visual or verbally descriptive modes and noticing under which conditions there are differences in apparent strategies used. Thus, Kosslyn (1980) reports that when participants are asked to visualize pictures of animals of various sizes and answer certain questions about their properties, the smaller the mental image, the longer it took participants to answer. These findings and others involving scanning time, rotation time, the need to keep moving the image

around the visual field in order to keep it from fading have suggested ways in which imagery processing has characteristics similar to that involved in visually examining objects.

Kosslyn (1980) also found differences in the types of cognitive tasks which appear to rely more on or be more easily answered in terms of imagery than propositional analysis. Thus the more overlearned the item, the more likely one will turn to propositional coding than visual coding to retrieve the information. The less frequently noticed properties of some object in contrast appear to be retrieved more easily by access to a visual system as opposed to a verbal descriptive memory. How visual and verbal, imagery and propositional modes are stored and accessed according to the needs of the task will continue to receive emphasis in research, as Kosslyn tests his model of images as data structures and processes involved in analogy with computer programming.

Kosslyn (1980) has also been interested in developing a developmental model for imagery processing and hypothesizes that children would tend to rely more on visual processing than do adults who have developed other skills in propositional coding. He argues (1983) that support for the hypothesis that children utilize more imagery than adults is suggested by some of his research. When given non-explicit instructions to verify the presence of certain properties as present in an object, adults seem to arrive at decisions faster than children, though with explicit instructions to solve the problem with visual images, adults and children resemble each other in the time it takes to complete the task. Perhaps adults are more efficient in zeroing in on key aspects of imagery or retrieving only parts relevant to the task when they are given

freedom to solve problems without specific instructions, argues Kosslyn (1980).

In addition to the growing interest in imagery in terms of models of processing information, imagery has been receiving attention as an important aspect of creativity. Rothenberg (1979), for example, notes the importance for creativity of "homospatial thinking" which he portrays as the process of imagining at least two separate objects existing in the identical space, a process that is particularly useful in the generation of new images and metaphors. Samuels and Samuels (1975) trace the history of visualization through many fields including the creative arts. Ferguson (1977) argues for the significance of nonverbal thought and imagery in the history of technological achievement in science, and traces the importance of visual models and reasoning in the major inventions of the Renaissance and following.

Cognitive Variables and Educational Psychology

The potential importance of cognitive variables for enhancing the learning of complex material has also been receiving attention in educational psychology and related areas. The role of imagery, diagrams, and other visual cognitive strategies used in teaching methodologies to facilitate learning have been conceptualized theoretically and/or studied empirically in a variety of ways. Kosslyn (1983) directs attention to the potential importance of increased use of imagery to facilitate learning in children, to individualize educational strategies in teaching individuals more responsive to visual modes, and in teaching problem-solving in everyday life situations. Research contrasting visual and verbal strategies for learning with respect to foreign language words has

received much attention, including for example the work of Delaney (1978) on the interaction between instructions and individual differences in skill relative to these variables.

Looking at the level of more complex subject matter, Day (1980) focuses on the consequences for conceptual organization and learning of material that follow from a variety of outline and pictorial lecture formats. She contrasts verbatim, linear presentations versus outlines, pictorial or graphic, and mixed formats for organizing lecture notes in terms of their advantages and disadvantages depending on the goals of the lecturer and learning needs of the class. Norman (1980) directs attention to the use of models and analogy in learning as a form of theory-building. His work suggests that students actively interpret and build upon raw material provided in lectures on the basis of their own experience and models. Instructors therefore can enhance clarity in this process through explicitly providing prototypic models to help organize information. Toth (1980) writes on the role of diagramming in teaching sociology and contrasts a variety of types of diagrams or "blueprints" of varying complexity which can enhance the way students unify their learnings. In his book Maps of the Mind, Hampden-Turner (1981) illustrates his synopses of key systems and theories of psychology with diagrams and charts contrasting the major points of view, a visual model approach which underscores the importance of multiple perspectives toward the same content area.

Examples of experimental research on cognitive imagery variables include the work of Rigney and Lutz (1976) who report significantly enhanced learning of chemistry concepts by students exposed to supplementary visual analogies which explained the

concepts compared to students receiving supplementary material in linear, verbal form. Wharton (1980) reports a study in which students showed higher comprehension and interest for textbook selections with higher imagery words, i.e., words which evoked stronger sensory associations, compared to more abstractly worded control selections. Richardson and Wylie (1984) report support in an educational setting for the effectiveness of practice with a variety of visual imagery strategies for problem-solving in enhancing students' verbal originality and fluency, two measures of creativity, and in a second related study, in increasing measures of internal control. In sum, the potential role for a variety of modes of cognitive imagery in enhancing learning has received much theoretical and empirical support.

Cognitive Imagery in the Teaching of Personality Theory

Possible implications of the use of cognitive imagery as a major tool of learning for college students can be seen for the teaching of Theories of Personality. In addition to more traditionally linear and verbal reviews and assignments related to reading, students in two advanced classes in personality theory were required to make diagrams or drawings of each major theory of personality, representing not only key concepts of each theorist but also indicating visually the way the various concepts were interrelated. While finding this task initially quite challenging, students reported that the experience was one of the most helpful they had ever had and had significantly enhanced their understanding of and ability to differentiate between theorists. Unusual variety and creativity was reflected in the drawings, ranging from highly abstract to very concrete representations. The project was described

as a conceptual and organizational as opposed to an artistic task, and highly imaginative and well-constructed projects were found even among students least exposed to any background in formal drawing. Some diagrams were highly schematic, connecting labeled concepts with a network of arrows; other diagrams conveyed more of a sense of the overall tone and atmosphere of the theorist's assumptions and emphases. Interesting contrasts could be made in terms of how the same theorist was portrayed by different students as well as how different theorists were portrayed by the same student.

Because self reports risk a high degree of subjectivity and no formal comparisons between these two classes and classes without this type of learning experience were attempted, the extent to which the presence of the diagram project served to enhance learning cannot be answered at this point. However, the addition of a learning exercise requiring imagery-rich forms of cognitive processing and mastery of material may offer a fruitful avenue to explore as a potential complement to highly verbal and linear ways of organizing and processing theoretical and conceptual material in a course like Theories of Personality. This paper is thus intended as a way of sharing a potential teaching methodology which draws from a cognitive-imagery paradigm and hopefully stimulating further study to determine the merits of such an approach in terms of facilitating learning.

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